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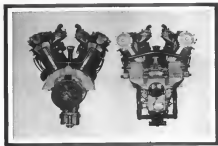
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Vol. XXII

MAY 9, 1922

No. 19

AVIATION

LAMAR E. ORCE EDITOR
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RALPH H. UNGER CONTRIBUTING EDITOR

Public Interest in Aviation

THE large crowd which answered the call of the Spring Flying Meet at Garden City attests the best information of the belief that the public, as a whole, is not interested in aeronautical events. It is possible that "trick flying" and other sorts of aerial acrobatics, taken by themselves, have to a large extent lost the fascination they once used to exert upon crowds. This is due chiefly to the fact that there have been many demonstrations of aerial acrobatics, at any rate in the neighborhood of the larger cities, that such exhibitions no longer are a novelty to a large percentage of Americans. This does not mean, however, that a meeting offering a well balanced program of flying events will not draw a crowd quite on the contrary.

It is quite surprising to what extent the knowledge of things aeronautical is beginning to penetrate that section of the public which is not directly concerned with aeronautics. At the Spring Flying Meet we have observed much intelligent comment on the evolutions of the airplanes from people who obviously were outside the field of the aeronautical world. Perhaps the fact that Long Island had during the war a great many Army flying fields has something to do with it. However, that be, it is gratifying to see the progress the public is making in currently appreciating the nature and significance of flying events.

This is an evolution which the aeronautical world ought to encourage and foster with all means at its disposal, for the more the public argues what may be called an "aeronautical sense," the greater will public air transport and private flying develop.

Organizers of flying meets can do much good in this direction by getting the public into more intimate touch with flying events than has been the case, with a few exceptions, heretofore. For instance, all aircraft participating in a meet should be marked with large letters or numbers so they can be recognized in flight, and the program should refer to them under their type, horsepower and year. The highly successful flying meets held before the war at Horden, near London, owed much of their success to the fact that the public had the means of knowing all the time what was going on in the air and who was doing it. Not only were the competing airplanes numbered, and duly listed in the program, but the latter also contained sketches of the machines as they would appear in flight, while a large score board made public the time of the laps or other results. Thus the man who went to Horden to learn something about his airplane's performance, and which performed best, and who was the most skilled flier, was given every opportunity to have his desire gratified.

Now it may seem on the surface that this extending to the interest of the wider masses is not warranted because it entails an expenditure out of proportion to the possible benefits.

Nothing could be further from truth. The man who goes home from a flying meet where he was enabled to understand in a fair degree what was going on, instead of receiving the impression that "a lot of flying machines were doing tricks," is a potential asset to the aircraft industry. He may never be able to purchase an airplane, but he will go to the next meet, where his accumulated knowledge will be increased, as a result of which he will begin to talk intelligently about things aeronautical.

In this manner, through a gradual process of education, an aeronautical opinion will be built up in this country. It does not seem likely that anyone would seriously suggest that we do not need such an opinion, especially in the matter of National Defense or in that of Commercial Aviation.

Heavy-Old Engines for Aircraft

MUCH attention attaches to the announcement made by the National Advisory Committee for Aeronautics in connection with its recent annual meeting that it was planning the development of a heavy-old engine for use in aircraft. While the details of the invention are still held confidential, it is known that this engine is of the direct injection type which does away with both carburetor and spark plugs, the fuel being injected by subjecting it to a suitable pressure.

The subject of heavy old engines has such an important bearing on the future of aircraft, and in particular of warships, that it seems desirable to summarize here briefly the different aspects of the question.

The principal advantages to be derived from such an engine are—first, and foremost, safety from fire; second, fuel economy, which not only means lower fuel costs from the use of a much cheaper fuel than gasoline, but also, as all pilots know, greater weight economy in pounds of fuel consumed per horsepower/hour.

We may reasonably expect at the same time some disadvantages in the heavy-old engine. Chief among these appear a greater fuel weight of the power plant, and perhaps also a decreased flexibility of control. The great problem that must be solved will be so to work out the design that the latter two items will at least mean within practical bounds, while preserving the reliability and, if possible, increasing it over that of present aircraft engines.

The light-weight heavy-old engine, newly desirable today, will be the main economy in the future as the demand for liquid fuel increases and the supply falls off. In the more distant future there may be foreseen the need of still another change—which we hope will be worked out before the need actually arises—the utilization of coal dust by direct injection in the engine.



The Curtiss "Curtis Kitten" making a loop on which Bert Acosta reached a speed of 200 m.p.h. at the Spring Flying Meet

Another feature was the Spring by "Bliss" Lewis of the Curtiss plane in which Glenn Curtiss won the first Gordon Bennett race in 1909 by attaining a speed of 43 m.p.h. The old plane was not only flown, but steered too, and stood the treatment as well as a 1922 ship.

In an eight mile headlong race across the water lands of Mitchell Field, Westbury and Hempstead, John Miller, in an Oriole, Entailed East, Bill Graham, second, and A. Hargrave, in a Sopwith "Cannard," third. Lloyd Rowland, holder with Eddie Brown of the world's duration record of 36 hr. 19 min. 38 sec., then took up the Mammot "Baby Vamp," probably the smallest plane in the world and made seven laps.

In the meantime a Martin Bomber of the latest (1932) model had come over from Mitchell Field and joined the aerial parade by making several circuits of the field. The big ship, with its heavily winged nose, gave a fearful impression of its power, although not many of the spectators knew just its type represented as the present moment the principal airplane element of the Air Service, and that it was being responsible for the making of the largest ex-German wreckage off the

Virginia Capes, last summer. The ship at the moment was filled with airplanes of all descriptions, various S.V.A.'s, "Messengers" and a Sopwith "Cannard" steering around in the joy of the spectators, while the jet racing machines were carrying out more grossly definite. Then a D.H. Ambulance came over from Mitchell Field and few several times around the field, the machine while color and red cross of the ship making it easy to identify. The Air Service then showed that it was ready for all emergencies—although no cause was given for this precaution for there was not even a forced landing during the entire meet.

The "Curtis Kitten" in Action

Toward the closing hour a big thrill was given the public when Bert Acosta stepped out of the neutral cockpit of its pilot decided to come in and just plotted, and checked out the small seat of the Curtiss "Curtis Kitten." As well be remembered, this machine was flown last fall in the Pulitzer Trophy Race, at Dayton, by Clarence Gossard, who finished second, Bert Acosta winning the race on the Curtiss-Navy



The Curtiss 'Curtis Kitten'—three of which were kept busy at the Spring Flying Meet carrying aerial passengers

man, the "Kitten" with its steady airplane wings and cross-axle, made a striking appearance when Acosta took her off the ground as a ball of fire and brought her back over the spectators. The speed at which the little ship shot around the field was so evident even to laymen, that there was a sense of almost constant "burst" made three elements and then came down, as he could not get all the "burst" out of his engine, but even so the speed of the "Kitten" was estimated at about 200 m.p.h. As no other engine was in the flight was not made over a 10-minute engine, as predicted by V.A.S. ratings, no record could be established. The new aircraft Acosta had flown the "Curtis Kitten" at an estimated speed of 200 m.p.h., which given here hope that when the engine is properly tuned up he will be able to beat the existing world's record of 220 m.p.h. made by Paul Lemoine in a Nieuport-Delage "monoplane" last fall in France.

The first event was a successful parade flown down from a D.H. by Sergt. Joe Devlin, of the Army Air Service. Altogether the Spring Flying Meet was a great success, the most so in the slightest making record it. The large audience showed beyond doubt that, given an interesting program, New Yorkers will patronize a flying meet in sufficient numbers to make its organization worth while. It is to be hoped that more meetings of this kind will take place during the flying season in the neighborhood of New York, for by showing the public the safety and reliability of airplanes a valuable educational work is performed.

Santa Maria Safe

On April 26 it was announced that the Aeromarine Airways flying boat Santa Maria, pilot E. Macchi, carrying three passengers and a mechanic was missing. The boat had left Key West at 8 a.m. the previous day on route for Nassau, Bahamas, a distance of 200 miles, and where she failed to arrive at the latter place a general search was organized by naval airplanes and flying boats of the Airways.

The "lost" flying boat was finally located on April 26 at night by a naval F-11 flying boat in command of Captain Bartlett, USN, who found the Santa Maria peacefully beached on the shore of a little bay on Williams Island, two miles south of Andros Island in the Bahamas group. All on board were found safe and sound.

According to the pilot, the Santa Maria had encountered unusually heavy winds on her trip out of Key West, and in looking from the cockpit sighted a reefing her, on Williams Island. Having sighted a small harbor he made a safe landing at 1:30 p.m., tied up to the beach and awaited assistance which he knew would not be long in coming. In the meantime he had the passengers seated in the cockpit and down the beach and prepared a good dinner from the supply of rations aboard the ship.

As soon as possible the passengers were transferred to a flying boat and taken on to Nassau. When the Navy flying boat located the Santa Maria they sent out a wireless message where she was located, then made a landing and supplied the air engine with sufficient gasoline and the crew on her return to Nassau.

In this connection it is well to point out that the Aeromarine Airways, which operates a fleet of flying boats between Florida and points in the Bahamas and the West Indies, has to date flown over a total distance of 150,000 miles, and have served over 10,000 passengers without a single serious mishap. Likewise it was an Aeromarine HS flying boat in which Eugene Egan made the record of airplane facilities on the Atlantic coast, printed in our last issue.

The Aeronautical Chamber of Commerce points to the safe record at Nassau of the air engine Santa Maria as another instance of the safety of even-war air transport when maintained by a company sufficiently well organized and financed to maintain their equipment in the best possible condition.

In commenting on the experience of the Santa Maria, C. F. Radford, president of the company said: "We did not have the least apprehension for the safety or even the comfort of

the passengers on the Santa Maria because the boat is as much as its element on the sea as it is in the air. The boat, an eleven-passenger cabin cruiser, always carries sufficient food and water to maintain its passengers for a week should the boat have to make a forced landing. Our system of signal equipment and navigation has enabled us to operate successfully for two years without serious trouble and the wonderful record of these flying boats on the service of the United States Navy is an additional assurance to their sea and air worthiness and general popularity."

The Santa Maria will leave Nassau in a few days for Washington and New York where it will be placed in regular service between New York and Atlantic City.

Book Review

THE AIRPLANE ENGINE, By Louis S. Marks, M.E.E., 304 p., illustrated with charts and drawings published by McGraw Hill Book Co., Inc. New York, 1932.

As stated by the author, this book attempts to furnish a concise knowledge of the functioning of the airplane engine, and to present and discuss the details of those engine whose construction has resulted in their survival.

The book contains a complete and well selected compilation of reports issued since the war by the Engineering Division, U. S. Air Service, the National Advisory Committee for Aeronautics, the Bureau of Standards, and by the corresponding British, French and German aviation organizations. It is in addition to this, the author has included the standard theories and formulas on internal combustion engineering in well arranged form.

The opening chapter presents the fundamental theory of flight in its simplest terms, discussing particularly the power requirements of the airplane.

The chapter on Engine Efficiency and Operation is particularly complete, much data being quoted, mostly from British reports, on the effect of various factors such as relative strength, compression ratio, etc., on engine performance. This is in addition to the usual theories of combustion and efficiency.

Chapter IV on Engine Dimensions and Arrangements contains the usual more or less unimportant attempt to tabulate accurate data on all existing airplane engines. Many of the data are, however, not very accurate, and the lack of information when the volume is so great. In the discussion of "those engines whose existence has resulted in their survival," the author is disappointed in not including the Daimler-Benz, the most successful of the engines of the two of the latest engine engines, the H.M.V. and the 200 hp. Benz.

The character of statistics might be more complete, in view of the scarcity of data in the literature on the subject. The American sources, but nevertheless is of considerable value.

The chapters on engine details, valve gear, regulation and other subjects are particularly complete and accurate of present practice. The chapter on fuels is also quite complete, but our regrets that the data are obtained principally from British sources, and very little mention is made of the work of the American investigation on Thomas Midgley and M. L. Harington.

Chapter X on carburetors is almost entirely a summary of National Advisory Committee researches at the Bureau of Standards, and, therefore, represents some of the most up-to-date information on the subject.

The remainder of the book consists of brief chapters on Fuel Systems, Ignition, Lubrication, Cooling, Exhaust, and other subjects. The chapter on Lubrication and Cooling is quite complete and gives considerable data from Dr. Gibson's British experiments on Air Cooling not hitherto generally available in this country.

In spite of the fact that the "Airplane Engine" suffers considerably from the author's lack of intimate contact with present developments in aviation engines, it is without doubt the most complete and detailed work on the subject which has yet been produced by an American author, and as such deserves a place in the library of all those interested in aviation.

Forest Mapping and Estimating from the Air

Brief Account of an Aerial Timber Survey Carried Out in the Canadian Woods by a Crew of Four Men

By Elwood Wilson

As foresters generally have shown much interest in the use of aereal and aerial photography for making forest maps and estimates, reconnaissance and so forth, it was thought that a description of a survey as actually carried out in Canada might be of interest.

Site of Operations

The area about which information was wanted was situated 102 miles in an air line from the air station and about 24 miles from the railroad, 16 over a wagon road, and the remainder by water. A site was selected for a base, and on an expansive, a cool, swampy region; and a few miles from the nearest town were set in by wagon and boat. Two tents were put up, one for sleeping quarters and the other for a mess tent. This was on the shore of a bay, and the site selected for an exchange was sheltered from all winds, and the water was deep enough to bring the nose of the plane up on the sand without endangering the hull. The beach was sandy and flat, and by a little easy digging a mud channel was formed into which the plane could be driven so that the engines could easily get at the running and water, and also refuel.

The crew consisted of Elwood Wilson, Forest Officer, Toronto, Michigan; E. Varian, and Rogers Hyde. The cat-dog used was a Cocker Spaniel named G. C. A. A. D.

Prior to beginning the work, the chief of party of another survey crew, which was engaged in a survey and estimate of a 60 square mile tract about 54 miles south of the shore base, was taken for a flight over the territory on which he was to work. He flew twice over the area with a map on which he made notations of the general lay of the land, the types of timber, and so forth, and the information proved of the greatest value in carrying out his survey.

The plane was mounted out in the open during the duration of the survey, and in spite of rain, heat, and the danger to damage and was certainly on the job. Trips were made in cloudy and rainy days, and photography was carried on as much as possible. The boats used were two in connection for four men, and could be used again the next year, showing that there is a reasonable life for aircraft.

Reporting Forest Fire

One interesting side line of this work was the discovery and reporting of forest fire. On Sept. 1, a fire was sighted 18 miles away from the plane at 1:30 p. m., and the plane landed at the nearest telephone station and reported it. It is generally certain that the ground patrol would not have discovered the fire at this time of day, and it would probably have assumed quite large proportions before being discovered the next day. Another fire was reported on Sept. 3, and on Sept. 4 a report having been received that a fire had occurred in a certain lake, the plane was sent to investigate, and reported that there had not been any fire. On all flights reports were made of fire burning, and areas already burnt were sketched and sent in to headquarters. Reports made from the air were afterwards checked on the ground, and found to be almost as accurate as in areas as the ground survey.

The total time spent in photography was 12.5 hr., and the area mapped was 250 square miles. This shows a performance of 20.8 square miles per hour of useful work. The work was done at, as nearly as possible, an altitude of 5000 ft., which gave plenty of detail for the interpretative work. In making a mosaic it is necessary to have the pictures overlap on all sides, and this was found difficult in both winds, but in ordinary weather it went well. The photographer directed the pilot on his course by hand signals, and there was perfect cooperation between the two. No reconnaissance flights were made strictly for that purpose, but in fact flights a considerable

amount of reconnaissance work, sketching, and oblique photography was carried on.

There was already an accurate map of the water course and lakes on the area, and when the photographs were taken the areas in the various timber types were transferred to it, and the areas plotted. The area with which this could be made from the photos, and their boundaries ascertained was remarkable. The types were divided as follows: uniform, containing 90 per cent of over of medium, spruce, or balsam or jack pine, conifer-hardwood, containing 50 per cent to 80 per cent of conifers, hardwood-conifer, containing 40 per cent to 60 per cent of hardwood, balsam, and spruce, and second growth, where young timber was coming in after fires. It was seen on the photos that there were very many places where blow-downs had occurred running from one to fifty acres or more. Most of these would not have been discovered by a steep survey with the plane, but a quarter of a mile apart, but when their approximate area was estimated from the photos it was found to be of importance. The percentage of the various types, as ascertained from the photographs, was as follows:

Conifer	35.9 per cent
Conifer-hardwood	36.1 per cent
Hardwood-conifer	24 per cent
Balsam	0.8 per cent
Second growth	0.7 per cent
Water	4.7 per cent
Scattered blow-downs	2 per cent of timbered area

How the Survey was Made

By comparing the photos with those taken in sections what the amount of timber per acre had been carefully determined and approximately estimate of the timber was made. The photos for ground study were picked out as representing the average of the stand. These photos have now been studied on the ground and checked up well. There was no difficulty in locating the areas, picked out on the photos for study, on the ground and counts of the number of trees in quarter acre plots on the photos when checked on the ground came within two to four trees. The photos of these sample plots and full descriptions of the timber, number of trees, heights, diameters, conditions, and so forth, have been mounted on cards and can be used for estimating other sections by comparison.

In the area under consideration, many timber fires have been killed by the spruce bud worm and other insects in the last five years. Most of the affected trees are dead and down, and their loss has resulted in opening up the stand. This increase of the density of standing spruce up well on the photos. Sample areas laid out on the photos and having the unstocked areas carefully photographed showed an average loss of stocked area of about 30 per cent.

Cost Factors

I am, unfortunately, not prepared to give out figures for the work for lumber reasons but I can state positively that if the latest costs for estimating the sample plots mentioned where are taken, and added to the estimate costs for the airplane work, salaries, fuel, insurance, depreciation, making of the final map on a basis of all the water course methods, the final cost will be \$20.00 per square mile less than that charged by a large firm of consulting foresters, for a lay town of land much more favorably situated and under of access, and \$20.00 less than figures of one of the large companies for work done in 1928.

The accompanying illustrations show several phases of the work, together with an aerial view of a flooded area and the finished map made from aerial photographs.



The photograph uppermost shows the river and part of the lake where water was raised and afterward lowered, also pine, spruce, and mixed timber. The two photographs in the center show one of the burns, while the lower picture shows the finished map.



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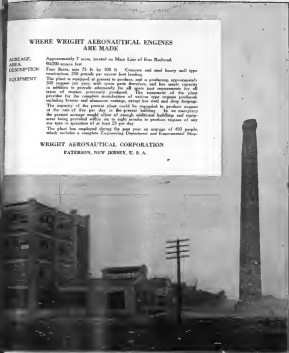
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The plant has employed during the past year an average of 450 people, which includes a complete Engineering Department and Experimental Shop.

WRIGHT AERONAUTICAL CORPORATION

PATERSON, NEW JERSEY, U. S. A.



"Who's Who in American Aeronautics"

(Copyright, 1932, by E. A. Korman, Editor, Jr., Inc.)

The biographical sketches of men who are pre-eminent in American aeronautics are published periodically in AVIATION. The first series will be shortly published in a more desirable form, and readers are invited to publish corrections or additions to the biographical sketches of men who are pre-eminent in American aeronautics. The first series will be shortly published in a more desirable form, and readers are invited to publish corrections or additions to the biographical sketches of men who are pre-eminent in American aeronautics. The first series will be shortly published in a more desirable form, and readers are invited to publish corrections or additions to the biographical sketches of men who are pre-eminent in American aeronautics.

William Terrell Atkinson

ATKINSON, WILLIAM TERRELL, Railway Engineer, born, Sept. 18, 1878, son of James C. Atkinson and Sadie Atkinson, Atkinson, Pa. Public schools of Pottsville, Pa. and University of Pennsylvania, Philadelphia, Pa.

Precedential 1901, with the Pacific Coast Exposition, Seattle, Wash. 1902, with the Panama-Pacific Exposition, San Francisco, Cal. 1903, with the Panama-Pacific Exposition, San Francisco, Cal. 1904, with the Panama-Pacific Exposition, San Francisco, Cal. 1905, with the Panama-Pacific Exposition, San Francisco, Cal.

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Albert Francis Zahm

ZAHM, ALBERT FRANCIS, Physicist, born, New York, Sept. 18, 1878, son of J. M. Zahm and Elizabeth Zahm, New York, N. Y. Public schools of New York, N. Y. and University of Wisconsin, Madison, Wis.

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James Francis Boyle

BOYLE, JAMES FRANCIS, Engineer, born, New York, Sept. 18, 1878, son of J. M. Boyle and Elizabeth Boyle, New York, N. Y. Public schools of New York, N. Y. and University of Wisconsin, Madison, Wis.

Precedential 1901, with the Pacific Coast Exposition, Seattle, Wash. 1902, with the Panama-Pacific Exposition, San Francisco, Cal. 1903, with the Panama-Pacific Exposition, San Francisco, Cal. 1904, with the Panama-Pacific Exposition, San Francisco, Cal. 1905, with the Panama-Pacific Exposition, San Francisco, Cal.

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Chas. Eugene Cheney

CHENEY, CHAS. EUGENE, Mechanical Engineer, born, New York, Sept. 18, 1878, son of J. M. Cheney and Elizabeth Cheney, New York, N. Y. Public schools of New York, N. Y. and University of Wisconsin, Madison, Wis.

Precedential 1901, with the Pacific Coast Exposition, Seattle, Wash. 1902, with the Panama-Pacific Exposition, San Francisco, Cal. 1903, with the Panama-Pacific Exposition, San Francisco, Cal. 1904, with the Panama-Pacific Exposition, San Francisco, Cal. 1905, with the Panama-Pacific Exposition, San Francisco, Cal.

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Seaplanes in Overseas Flights

The method used by the U. S. Navy for keeping track of the progress of seaplanes on overseas flights given exact coordinates against the line of coast and positions of islands and other navigational facilities are available, the method also prevents the loss of planes.

All planes that make long passages are equipped with radio sets of sufficient capacity to communicate with a ship or station at the shore end of the route of each flight in the passage. For example if the distance of the flight between two or more islands is a thousand miles, a radio set good for at least five hundred miles is required.

For any flight where there is a possibility of a three-day landing at a locality on sea or land where there may be difficulty in making the plane that is down, planes are never given out to make a flight where they always go in pairs, and the two men on board are instructed to land at the same place.

For example, if the distance of the flight between two or more islands is a thousand miles, a radio set good for at least five hundred miles is required. For example, if the distance of the flight between two or more islands is a thousand miles, a radio set good for at least five hundred miles is required.

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In addition to making reports of forced landings, the leader in each pair of planes makes a "position report" at pre-arranged times in the flight usually three position reports for every pair of planes at half hour intervals and submit complete reports of distance made good on the pre-arranged times, with the times the reports are made, for example, "16 and 22 O. K. 450 at 1430" signifies that planes number ten and twelve were together at their pre-arranged time and had flown four hours from their starting point at 2:30 p. m. The ship or station at each end of the route "inter-see" for all position reports and as each is received, the numbers of the planes and the times of their reports are plotted on a chart at the reporting stations along the line of the route. In this way the ship or station at one end of the route or the other end is aware of the position of the planes from time to time.

Each case of a forced landing is carefully studied to learn position and clear information on the locality to send assistance to.

In case of the very remote chances of failure of the radio sets in both planes of a pair simultaneously, it is one of the even more remote chances that both planes have a forced landing simultaneously, the information on the locality is not so close, but the last position report received will indicate the most favorable locality for search. For example, six planes "10 and 12" proceeding at 80 m.p.h.—were reported "O. K." 450 miles at their time at 2:30 p. m. and were landing position at 3:00 p. m. at half hour intervals as usual. If they were then at their time, it is evident that the radio sets of both planes have failed or that both have been forced down somewhere between 450 and 480 miles from the start, and are somewhere close to the line of the route.

As all naval supplies carry plans for firing colored stars and an ample supply of the stars, the area to be searched is a star the size of the moon to make it easy for a single ship to find the planes) or even so it is that the colored stars are seen at a distance of 15 to 20 miles. In thick weather, of course, it is necessary to send more than one ship on the search and the searchers are more difficult, but evidently they are very far less difficult than a search over the whole length of the route, which would be necessary when planes not equipped with radio make passages alone.



Official Photo U. S. Navy
The late of the Navy Emergency Seaplane Radio Transmitter, described in our issue of March 27, 1932

Human Factors in Flying

Few people realize that a small part of the most vital law in the world with which we have to do is the human factor in flying. The ability of a man to handle an airplane or ship.

Since the close of the war the National Research Council has had several projects connected with the study of human factors in flying, involving "biological" experiments on men and animals, anatomical, physiological and psychological studies of the functions of the eye and associated eye movements, the weight of the body, and the color and the shape of the plane bibliography on the subject. Last year the workers in this field came together and organized themselves into a committee on Visual Research for the purpose of studying the visual factors in flying work in the field. This committee has inaugurated a project on "The Experimental Study of Human Factors in Flying," which has been approved by the National Research Council. That project aims at gathering together the scattered data on human factors in flying, and presenting a summary of them, etc.

The project will be administered by an executive committee, at the present time composed of Dr. J. Graham Wilson, Chair, Dr. H. H. Woodworth, and Dr. F. H. Woodworth. In cooperation with the Chairman of the Division of Biological and Agricultural, Medical Sciences and Anthropology and Psychology in the National Research Council.

The Air Service is giving its active co-operation to the investigators through a special committee.

The National Research Council is now setting to find some persons who will be willing to give up their time and money to provide not less than \$25,000 covering the research investigations of this committee during the period of two years.

ARMY AND NAVY AIR NEWS

Army Service

Langley Field.—The loss of the shipboard beam created quite a need in the big lighter than air blimp at Langley Field, Va., and, in consequence for its loss an English Malacca type airship was called about three weeks ago and has since been repaired quite extensively. It is being used for the training of cadets in the handling of emergency situations.

The Malacca type airship was developed by the British in 1918 for use on a short range coastal patrol ship. It is fitted with two 75 hp. Buick-Reno "Hawt" engines, mounted above the fuselage of a streamlined nose and driving propeller driven. The envelope has a capacity of 100,000 cu. ft. and measures 105 ft. in length, 40 ft. in height and 35 ft. in diameter. With the standard full running speed is 57.5 mph. The ship's altimeter shows that it is the fastest airship in the United States today. On several occasions it is claimed that a speed in excess of 61 mph has been achieved.

This ship is very light and needs in appearance, and often considerably less assistance to the wind on account of the construction of suspension, and the shape of the bag itself. It has the customary two balloons and from very small. It is reported, however, that the directional controls are not function as accurately and promptly as would be desirable. This is no doubt due to the fact that there is no top tail surface. All directional stability is taken care of by a lower tail surface, in which the rudder is attached, and this results in a slight amount of rolling. On altitude control the ship behaves consistently and promptly. The car is light and well designed. Forward air movements can be carried, although the situation better with only four passengers.

Shortly after the American War Department purchased one of this type of airship. The first one was delivered at Langley Field in 1918, but was destroyed when the temporary hangar blew down. Since that time A and C type of ships have been operated for experimental purposes, and this is the first time a Malacca has been put in the air.

The Malacca is also called the B-7, which stands for "Submarine Rescue Train" being motorized with two engines. This type of airship performed feats of considerable duration for the British Navy and was used for locating and bombing of submarines. Quite a few German submarines were destroyed through the agency of this airship.

Elkhart Field.—A report from Elkhart Field, Houston, Tex., is to the effect that on May 10, the fastest reconnaissance flight between Elkhart Field and Kelly Field was made by Lt. R. T. Aldrich on an MD-3 on April 3. The duration of the flight was 1 hr. 23 min. (153 s. 100 ft.). The distance between these two stations is 230 miles.

The 1st Group (Transfer) at Elkhart Field, Texas, is being equipped with Speed and MD-3 planes. It is planned to have enough MD-3s and Speeds in the squadron to equip each officer of the group with a plane, plus preparation for the forthcoming annual tactical training operations to be conducted during the latter part of June.

Clark Field.—Lt. R. Bass, Jr., gave the personnel of Clark Field, Pennsylvania, P. I., and not a few visitors, a thrill when he made a night flight in the plane of the 1st Group. The Red lights were readily installed on the hangar for emergency use. Lieutenant Bass remained on the air for an hour, during which time he gave over the management of troops located several miles southeast of the field and gave them the proper paper. A perfect landing was effected, but due to the rough field a shock absorber was broken, without mishap, however.

Meber Field.—The entire class of flying cadets assigned to Meber Field, M.D., Calif., completed their flying training and will receive commissions in the Reserve Corps, viz:

James C. Ayres, Walter A. Arden, John M. Barnes, Donald M. Correll, Paul W. Cramer, Robert J. Cullen, John E. Rand, Robert C. Dallas, Clarence E. O'Brien, William G. Gordon, E. H. Hargrave, Guy F. Rice, Theodore E. Jones, J. H. Johnson, Andrew J. Marshall, W. McKinley, John C. McMillan, William M. K. Ford, Arthur L. Smith, Men M. Starnberg, Donald A. Tompkins.

On the ship, Captain Hargrave, and Ayres took the command of the appointment as 1st Lieutenant, Reserve Army, at the Presidio of San Francisco. The results of their examinations have not yet been determined.

The command at Meber Field, was treated to an interesting lecture on aerodynamics, aerodynamics, and study on the part of the students by Thomas H. Reed, of the San Francisco Weather Bureau. Mr. Reed's work in aerodynamics has been well and varied. Added to this knowledge is his experience as an instructor with the Army and American forces during the war, making him an authority on the subject as applied to flying particularly. His talk was of absorbing interest to the cadets, and the information passed will be of great assistance to each one.

Kelly Field.—Flight J G Duffell of the Department of Agriculture, made flights on March 27 and April 1, from Kelly Field, with Lt. E. F. Bocher as pilot, in connection with experiments he is conducting with a view to determining the limits of his species of wheat near the country. The flight on March 27 was made in a DH-4B and the flight on April 1 in a JH-8B. It is the belief of the officials of the Agricultural Department that the spore of this parasite tends to be spread by the wind, and the results of the flight are of great importance. Plans with a view to making an out-of-the-way on a rock on the wing, and by similar arrangements are expected to be continued in the near future, whenever desired. Reports were made at every 500 ft. up to 3500 ft. and the success. In this experiment the JH-8B was most satisfactory than the DH-4B, the air stream of which prevented the stream from closing again.

Greer Field.—In the event formerly planned in authorized for this season, there is not a word in the first Squadron at Greer Field will not be eager for this duty—which, by the way, is not strange, considering their phenomenal ability to make such a flight. The flight was made on the 1st of May, and will be made. Flight cadets are being enrolled in the Rapid Corps Radio School, being conducted at the Presidio, where they will receive a thorough course in aviation and maintenance of radio. Two experimental radio operations are now in flight with the Post Radio Department, and the ships of the 9th are rapidly being equipped with newly constructed equipment. The pilots and observers are receiving constant instruction, being required to work with the same station while on flight.

Transfer of Army Airplanes.—Fifty DH-4s and fifty JH-8Bs were recently transferred from the Air Service to the Bureau of Naval Aeronautics without transfer of funds. The DH-4s are estimated as worth about \$8000 and the JH-8Bs about \$6000 each. Shipment of the DH-4s was made from the Rockwood Intermediate Air Depot to the Philadelphia Navy Yard, and the JH-8Bs were shipped from the Air Service depot at Annapolis, Md., to the Bureau of Naval Aeronautics where they will be used for training purposes.

Fielded Air Intermediate Depot.—The JH-8B airplane, which was produced at the Fairfield, Ohio, Air Intermediate Depot into a hospital ship, has been completed and, as soon as weather conditions permit, it will be flight tested. From one standpoint, it is the only ship of its kind that has ever been constructed. A special rider, constructed in the fuselage and easily removable by jacking him, makes a very desirable airplane for the purpose of investigating injured persons. The airplane is provided with a special rider, which is absolutely in front of the litter and just back of the pilot's cockpit during the tail surface. It is so situated that at all times the physician or attendant is able to observe the patient through a window which is cut in the fuselage. This type of ambulance airplane is a decided step forward in swifter injured persons by airplane.

Army Orders.—First Lt. Russell M. Greenwaldt, A. R., upon his arrival in the United States, will proceed to Kelly Field, Texas, and report in person to the commanding officer for duty.

Capt. Frank C. Vane, Medical Corps, is relieved from his present temporary duty at the Medical Research Laboratory School, Fort Meade, Md., and will report in person to the commanding officer for duty at the Army Medical School, Fort Detrick, Md., on or about May 1, 1937, and from further assignment and duty at the United States Soldiers' Home, Washington, D. C., and will proceed to Fort Meade, Md., and report in person to the commanding general for duty as flight surgeon.

First Lt. Douglas H. Arthur, A. R., upon his arrival at the United States, will proceed to Langley Field, Hampton, Va., and report in person to the commanding officer for duty. Maj. George E. A. Remberg, A. R., is detailed as a member of the board of officers appointed by paragraph 18, Special Circular No. 1, War Department, Gen. Order No. 1, 1937, as the War Department, Board of Construction and Adjutants, via Maj. Roy M. Jones, A. R., briefly relieved.

First Lt. Michael E. McElroy, A. R., is relieved from temporary duty at Langley Field, Hampton, Va., and will report in person to the commanding officer for duty at Camp Rialto, Va., and upon completion of his present course of instruction in the Airship School, will proceed to Aberdeen Proving Ground, Aberdeen, Md., and report in person to the commanding officer for duty with the Air Service troops.

First Lt. Lewis P. Arnold, A. R., is relieved from further duty at Langley Field, Hampton, Va., will proceed to Manassas, Va., and report in person to the commanding officer for duty at the Army Intermediate Depot, for duty with the 2nd Squadron.

First Lt. Robert S. O'Connell, A. R., is relieved from temporary duty at the Army Intermediate Depot, Fort Belvoir, Calif., and will proceed to his proper station, Langley Field, Hampton, Va., and report to the commanding officer for duty.

First Lt. Randolph W. Preget, A. R., is relieved from duty at the Long Island air reserve depot, Long Island, N. Y., and will proceed to the Army Depot, 30 Whitehall Street, New York City, and report in person to the officer in charge.

Capt. Robert C. Canale, Cavalry, is detailed in the Air Service under the provisions of section 4 of the national defense act, as amended, effective July 1, 1932. Captain Canale was in his present detail at Carlisle Field, Pa., until the beginning of the next course in pilot training for lieutenants in 1937, at which time he will report in person to the commanding officer Carlisle Field for the purpose of preparing that course.

Naval Aviation

Handling 6048H.—The Bureau of Aeronautics, Navy Department, directs attention to the fact that the type DH-4B airplane is not designed to stand the strains involved in the performance of loops, Immelman turns, spins or rolls. The DH-4B should not be rolled under any circumstances, except a slow roll at a speed in excess of 250 m.p.h. in a loop.

Navy Orders.—Lt. Comdr. Henry B. Cord, Det. Air Squadron Atlantic Fleet to duty Bureau Aeronautics, Navy Dept., Washington, D. C.

First Lt. Lloyd C. Smith, (Supply Corps), det. Navy Yard Norfolk, Va., to Naval Air Station Chatham, Mass.

First Lt. George R. Ford, EP, det. Naval Air Station San Diego, Cal., to home and sail orders.

First Lt. Ross B. Bates, det. Naval Air Station, Pensacola, Fla., to Bureau Aeronautics, Navy Dept., Washington, D. C.

First Lt. Edward Fisher, det. S. H. Harbors, Hampton Roads, Va., to USS Langley.

First Lt. Harshard B. Wolter, det. USS Hawkstone, to duty USS Langley.

Lt. (jg) Herman W. Lucas, HF, det. Naval Air Station, Coco Solo, C. Z., to home and sail orders.

Admiral Moffat on Inspection Trip.—Rear Admiral Wm. A. Moffat, Chief of Naval Aviation, made a trip to Detroit to inspect the flying division and aviation section of the Detroit Naval Air Station. He was the guest of the local Chamber of Commerce and addressed three gatherings: one at a luncheon party, another at dinner and finally a large meeting in the evening.

Hampson Beach Naval Air Station.—There were 168 precision flights made during the week ending April 15 by members of the 1st Squadron, 1st Marine Division, and one precision race was made on the dummy track with a DH-4 and a VBT plane. The exhibition of an aerobically gear as a VET was completed. An HF had been equipped with Allen-Darlington landing gear and is ready for use.

Plan to Visit on Navy Bill.—When the Navy Bill was coming up in the House, Congressman F. G. Horne, of New York, was on route to the United States on the Navy transport Henderson from the West Indies, anxiously hoping that he would reach the capital in time to vote as the Bill. Hearing Norfolk on April 13, he requested the Commandant of the Naval Base to give him airplane transportation to Washington, which was done and he reached the city in time to vote on the Bill. His characteristic of the Navy Bill was to vote as the Bill and the Navy Bill gave him an opportunity to use an airplane on a personal record requiring speed.

Coming Aeronautical Events

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|------------|--|
| May 10 | Fourth Annual Aircraft Exhibition, Logan Field, Baltimore, Md. |
| May 11 | Second Baltimore Race, Baltimore, Md. |
| May 12-13 | Flying Meet, Hammond, Ill. |
| May 14 | Detroit Aerial Derby Derby, Detroit (Continued from page 248) |
| May 15 | Second St. Louis Derby, St. Louis (Follier) |
| May 16 | Triumph Race |
| Sept. 20 | First Annual Intercollegiate Championship Meet. (In preparation.) |
| FOREIGN | |
| August | Coupe Jacques Schneider. (Simplest speed race) |
| Aug. 6 | Coupe Bonnet-Ballouin Race, Geneva, Switzerland. |
| Aug. 20-21 | Soaring and Gliding Competition, Clermont-Ferrand, France. |
| Aug. 24-25 | Soaring and Gliding Competition, Garmisch, Germany. |
| Sept. 15 | Coupe Henri Deutsch de la Meurthe. (Lift plane speed race) |
| Sept. 16 | American gliderplane trials, if required, as to hold about Aug. 25, at Mitchell Field, L. I. |

Foreign News

Czechoslovakia—Engineer Janak, head of the Automobile and Flying Department of the Ministry of Social Welfare, recently concluded with representatives of the German government a provisional agreement on a reciprocal basis regarding regular air service, passengers and goods, between Prague and Berlin. The governments of the two countries will each select a company to participate in the service, which will either be alternatively or simultaneously in opposite directions.

This means that as soon as Germany is permitted by the Peace Treaty to make international flights (end of 1922) German machines will be allowed to fly to Prague and over Czechoslovak territory. A new flying company will be formed at Prague, under the protection of the Legio Bank, with a capital of 8 million kronen. The amount of the government subsidy, which will be paid to this company, has not been fixed, but it is expected that it will be equal to that allotted the Franco-Romanian company. This new Czechoslovak aviation company will use, as far as possible, airplanes of Czech manufacture. Recently the Aero aircraft factory at Prague has successfully tried out an air transport limousine, which will probably be unexcelled by the new aviation company. The Aero limousine has a wing area of 52 sq. meters and a carrying power of 40 kg./sq. m., weight 1300 kg., and will have a capacity of five persons and 100 kg. of baggage, and will carry fuel for 4 hr. flight. The engine is a German 260 hp. Maybach.

Italy—The Army Air Service has instituted a special school for licensed pilots of pursuit airplanes. This school will last for two months, and will be divided into two courses. The first of these comprises aerobatic lessons on dual control ships performed by the pupil together with the instructor on board. After that the pupil will do all the aerobatic drills by himself under the surveillance of the instructor from the ground, until he reaches perfection. The drills include turns on the wing, backwards, reversed, spinning to the right and left, loopings from left to right, side slipping to the left and right, tail sliding, reversed flights, right and left loopings, spiral spinning left and right, and reversed spinning left and right.

The second course comprises aerial pursuit drills. The pilot, after becoming a perfect aerobat, will perform a combat against another airplane driven by the instructor. These aerial combats will enable the pilot to get accustomed to the aerobatic stunts which will be employed not only in defending himself but also attacking his enemy, according to the different aerial tricks which the school will teach.

After the pilots have passed this test two of them, in airplanes of the same type, will fly in opposite directions, and at a height of 3000 ft. they will start an aerial fight which will last 30 min. Each airplane will be provided with a photographic sight in order to photograph the opposite airplane when this is in a condition of inferiority. A test commission will judge the result of this aerial fight. The pilot whom the Commission considers superior to his adversary will be approved, while the defeated pilot must repeat the test according to the following system:

With twenty approved aerobatic pilots, ten couples will be formed; of these ten couples it will result "ten approved" and ten "defeated." Of the "defeated" ten "five" couples will be formed, of which five will be "approved" and five "defeated." The defeated five must couple with pilots already approved and if their result is superior to their adversary they will be approved, if contrary the course must be repeated.

A license will be given to the approved pilots.

Russia—A statement in a Russian newspaper announces the formation of a Russo-German air traffic company, which will begin operations by establishing an air route between Moscow and Königsberg, to connect with the Berlin-Königsberg express train services. An agreement has already been concluded between the Russian commercial delegation in Berlin and German interests, among whom are Herr Rathenau's organization, the General Electrical Co., the Hamburg-Amerika Line, and the Zeppelin Co.

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